KULIK, D.M., zasluzhennyy vrach BSSR, kand.med.nauk

Mistakes in the diagnosis of cancer of the pancreas. Zdrav. Belor.
6 no.4:24-25 Ap '60. (MIRA 14:5)

1. Mogilevskiy oblastnoy psikhonevrologicheskiy dispanser.
(PANCREAS--CANCER)

KULIK, D.M.

Mistakes in the diagnosis of psychoneurological diseases.
Zdrav. Belor. 6 no. 7:30-33 Je '60. (MIRA 13:8)

1. Zasluzhenny vrach BSSSR, kandidat meditsinskikh nauk.
(METAL ILLNESS)

KULIK, D.M., kand.med.nauk, zasluzhennyy vrach BSSR

Hypnotherapeutic method in hysteric gait disorders. Zdrav.Bel. 8 no.2:30-32 F '62. (MIRA 15:11)

1. Iz Mogilevskogo oblastnogo psikhonevrologicheskogo dispansera.

(PARALYSIS, HYSTERICAL) (HYPNOTISM—THERAPEUTIC USE)

TRUSOVA, M.V.; KULIK, D.M.

Century of the Mogilev Scientific Medical Society. Zdrav.Bel. 8 no.5:62-65 My '62. (MIRA 15:10)

1. Zaveduyushchaya Mogilevskim oblastnym otdelom zdravookhraneniya (for Trusova). 2. Predsedatel' Mogilevskogo nauchnogo obshchestva vrachey (for Kulik).

(MOGILEV—MEDICAL SOCIETIES)

KULIK, D.M., kand. med. nauk, zasluzhennyy vrach BSSR

Effectiveness of the treatment of chronic alcoholism based on catamnestic data. Zdrav. Bel. 9 no.3:34-36 Mr'63
(MIRA 16:12)

1. Iz Mogilevskogo oblastnogo psikhonevrologicheskogo dispansera.

TRUSOVA, M.V.; KULIK, D.M. (Mogilev)

From the history of the Mogilev Scientific Society of Physicians; on the 100th anniversary of its founding. Sovet. zdravookhr. 5: 64-69 '63. (MIRA 17:2)

1. Zaveduyushchaya Mogilevskim oblastnym otdelom zdravookhraneniya (for Trusova). 2. Predsedatel' Mogilevskogo nauchnogo obshchestva vrachey (for Kulik).

KULIK, D.M.

Catamnesis of patients with psychic disorders developed following antirabies vaccinations. Zhur. nevr. i psikh. 65 no.6:913-917 '65. (MIRA 18:6)

1. Mogilevskiy oblastnoy psikh nevrologicheskiy dispanser (glavnyy vrach G.S. Lyalina).

KULIK, D.M. (Mogilev)

Complications in antirabies inoculations. Sov.med. 28 no.4:89-92 Ap '65. (MIRA 18:6)

AL'PEROVICH, P.M., prof., PISHEL', Ya.V., kand.med.nauk, BILYK, V.D.
KULIK, D.Ye.

Some problems in local dispensary treatment for neurological patients in a rural district. Vrach.delo no.3:269-272 Mr'58 (MIRA 11:5)

1. Kafedra nervnykh bolezney (zav. - prof. P.M. Al'perovich) Vinnitskogo meditsinskogo instituta.
(NERVOUS SYSTEM--DISEASES)

KULIK, F.

Branch stations should be established on every large farm. Nauka i pered.op. v sel'khoz. 8 no.11:66 N '58. (MIRA 11:12)

1. Kolkhoz im. Lenina, Priterechnyy opornyy punkt Checheno-Ingushskoy gosudarstvennoy sel'skokhozyaystvennoy opytnoy stantsii.
(Agricultural experiment stations)

KOROVIN, A., nauchnyy sotrudnik; KULIK, G., nauchnyy sotrudnik

Monetary wages instead of payment in kind. Nauka i pered.op. v sel'khoz. 9 no.1:21-24 Ja '59. (MIRA 13:3)

1. Sibirskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta ekonomiki sel'skogo khozyaystva.
(Collective farms--Income distribution)

KULIK, G.; KOROVIN, A.

Monetary payment of wages on Siberian collective farms. Sots. trud
5 no.9:28-34 S '60. (MIRA 13:10)
(Siberia, Western—Collective farms—Income distribution)

KULIK, G.D.

Fire extinguisher for gas-engine compressors. Bezop.truda v prom. 3 no.8:34 Ag '59.
(MIRA 12:11)

1. Neftepromyslovoye upravleniye Abinneft'.
(Compressors--Safety appliances)

[illegible]

SHAKHBAZYAN, G.Kh.,professor (Kiyev); KULIK, G.I. (Kiyev); VUL'FSON, R.Kh.
(Kiyev)

Preventing caries in adolescents by increased vitamin intake.
Probl. stom. 3:19-22 '56 (MLRA 10:5)
(TEETH--DISEASES) (VITAMIN THERAPY)

KULIK, G.I. [Kulyk, H.I.]

Neurohumoral shifts in chronic mercury poisoning and the effect of unithiol. Fiziol.zhur. [Ukr.] 5 no.4:547-554 Jl-Ag '59.
(MIRA 12:11)

1. Kiyevskiy meditsinskiy institut, kafedra gigiyeny truda.
(MERCURY--TOXICOLOGY) (PROPANOL)

KULIK, G.I.

Diagnostic significance of the presence of mercury in the urine under long-term exposure. Vrach.delo no.10:1065-1066 O '59.
(MIRA 13:2)

1. Kafedra gigiyeny truda (zaveduyushchiy - chlen-korrespondent AMN SSSR, prof. G.Kh. Shakhbazyan) Kiyevskogo meditsinskogo instituta.
(MERCURY--TOXICOLOGY) (URINE--ANALYSIS AND PATHOLOGY)

KULIK, G. I.

Cand Med Sci - (diss) "Problem of individual prophylaxis of mercury intoxications." Khar'kov, 1961. 14 pp; (Ministry of Public Health Ukrainian SSR, Khar'kov State Medical Inst); 200 copies; price not given; (KL, 5-61 sup, 203)

KULIK, G.I. (Kiyev, ul. Vladimirskaya, d. 48, kv.5-a)

Changes in the amount of sulfhydryl groups in the blood serum and tissues of transplanted rat tumors under the effect of alkylating antineoplastic preparations. Vop. onk. 10 no.7:70-74 '64. (MIRA 18:4)

1. Iz laboratorii eksperimental'noy terapii opukholey Ukrainskogo nauchno-issledovatel'skogo instituta eksperimental'noy i klinicheskoy onkologii (dir. - akademik AN UkrSSR prof. R.Ye. Kavetskiy).

KULIK, G.I.; DANILENKO, L.P.

Changes in the blood serum protein fractions during chemotherapy in cancer of the ovaries. Vop. onk. 11 no.2:30-34 '65.

(MIRA 18:7)

1. Iz laboratorii eksperimental'noy terapii opukholey Ukrainskogo nauchno-issledovatel'skogo instituta eksperimental'noy i klinicheskoy onkologii (rukovoditel' - akademik AN Ukrainskoy SSR prof. R.Ye. Kavetskiy) iz ginekologicheskogo otdeleniya klinicheskoy bol'nitsy Radyanskogo rayona g. Kiyeva (glavnyy vrach N.A. Shevchuk) i akushersko-ginekologicheskoy kliniki Nr. 1 Kiyevskogo meditsinskogo instituta (zav. kafedroy - prof. N.S. Baksheyev).

BYKOREZ, A.I. [Bykoriez, A.I.]; KULIK, G.I. [Kulyk, H.I.]

Chronic liver diseases caused by hepatotoxic sera. Fiziol. zhur. [Ukr.] 10 no.2:271-274 Mr-Ap '64. (MIRA 18:7)

1. Ukrainskiy institut eksperimental'noy i klinicheskoy onkologii, Kiyev.

KULIK, G.I. [Kulyk, H.I.]; BYKOREZ, A.I. [Bykoriz, A.I.]

Blood proteins in rats induced with liver tumors by p-dimethylaminoazobenzene and following the introduction of hepatocytotoxic serums. Ukr. biokhim. zhur. 36 no. 4:559-564 '64.
(MIRA 18:12)

1. Ukrainskiy nauchno-issledovatel'skiy institut eksperimental'noy i klinicheskoy onkologii Ministerstva zdravookhraneniya UkrSSR, Kiyev.

FEDOROV, Aleksandr Ivanovich [Fedorov, O.I.]; SNEGUR, Grigoriy Prokof'yevich [Snihur, H.P.]; KULIK, Georgiy Kuz'mich [Kulyk, H.K.]; CHERNOV, M.P., red.; NEMCHENKO, I.Yu., tekhn. red

[Cultivation and use of hybrid sugar beet seeds] Vyroshchuvannia ta vykorystannia hibrydnoho nasinnia tsukrovykh buriakiv. Kyiv, Derzhsil'hospvydav URSR, 1961. 98 p. (MIRA 15:7)

(Ukraine--Sugar beets)

YENIKEYEV, N.B.; KOBAKHIDZE, V.N.; KULIK, G.T.; TREBUKOV, A.L.

Using a breakdown system with mined charges in mining hard ore deposits. Gor.zhur. no.2:15-19 F '56. (MLRA 9:5)
(Mining engineering)

OSTROUSHKO, I.A.; YEMEKEYEV, V.I.; BOBIN, Ye.G.; KOBAKHIDZE, V.N.; YARMIZIN,
V.Ya.; KULIK, G.T.

Industrial testing of mechanical charging of deep, horizontal blast holes. Izv. vys. ucheb. zav.; tsvet. met. no.1:20-27 '58.
(MIRA 11:6)

1. Severokavkazskiy gornometallurgicheskiy institut. Kafedra spetskursov gornogo dela.
(Mining engineering)

MIKHNOVSKAYA, N.D.; ROTMISTROV, M.N., doktor biologicheskikh nauk;
STETSENKO, A.V., kand. khim. nauk; KULIK, G.V.

Studying the fungicidal properties of chlorine derivatives of salicylanilide and carvacrol. Dokl. akad. sel'khoz. 23 no.9:35-38 '58.
(MIRA 11:10)

1.Kiyevskiy gosudarstvennyy universitet imeni T.G. Shevchenko. Predstavlena akademikom S.N. Muromtsevym.
(Fungicides) (Salicylanilioe) (Carvacrol)

ROTMISTROV, M.N. [Rotmistrov, M.M.]; STETSENKO, A.V. [Stetsenko, O.V.]; KULIK, G.V. [Kulyk, H.V.]; VASILEVSKAYA, I.A. [Vasyleva'ka, I.O.]; KHARCHENKO, S.N. [Kharchenko, S.M.]

Study of new synthetic antimicrobial substances. Mikrobiol. zhur. 21 no.3:31-35 '59. (MIRA 12:10)

1. Z kafedri mikrobiologii Kiivs'kogo derzhavnogo universitetu.
(SALICYLIC ACID rel cpds)
(ANTIBIOTICS chem)

ROTMISTROV, M.M.; KULIK, G.V. [Kulyk, H.V.]; VASILEVSKAYA, I.O. [Vasylevs'ka, I.O.]

Antimicrobic characteristics of bromine and iodine derivatives of salicylic acid anilide. Visnyk Kyiv.un. no.2. Ser.biol. no.1:81-84 '59. (MIRA 16:4)
(SALICYLANILEDE) (ANTIBIOTICS)

KULIK, Gennadiy Vasil'yevich; TIKHOMIROV, Mikhail Ivanovich; LAPIDUS, M.A., red.; GUREVICH, M.M., tekhn.red.; ZUBRILINA, Z.P., tekhn.red.

[Organizational-economic plan for reducing collective farm expenditures] Organizatsionno-khoziaistvennyi plan snizheniia zatrat kolkhoza. Moskva, Gos.izd-vo sel'khoz.lit-ry, 1960. 83 p. (MIRA 13:6)

(Siberia, Western--Agriculture--Costs)

ROTMISTROV, M.N.; STETSENKO, A.V.; KULIK, G.V.; VASILEVSKAYA, I.A.; BAYSHEVA, V.G.; GAMALEYA, N.F.

Antimicrobial properties of some acenaphthene derivatives. Mikrobiologiia 29 no.5:757-761 S-O '60. (MIRA 13:11)

1. Kiyevskiy gosudarstvennyy universitet.
(ACENAPHTHENE) (ANTISEPTICS)

ROTMISTROV, M.N.; ZAKSON, M.L.; KULIK, G.V.; GAMALEYA, N.F.; VASILEVSKAYA, I.A.

Use in stomatology of new synthetic antimicrobic preparations. Stomatologiia 39 no.6:22-26 N-D '60. (MIRA 15:1)

1. Iz kafedry mikrobiologii i antibiotikov) zav. - prof. M.N. Rotmistrov) Kiyevskogo gosudarstvennogo universiteta.
(STOMATOLOGY) (ANTISEPTICS)

ROTMISTROV, M.N.; KULIK, G.V.; VASILEVSKAYA, I.A.; MIKHNOVSKAYA, N.D.;
GAMALEYA, N.F.; RUDAYA, S.P.

Synthetic antimicrobial substances with antibioticlike properties.
Antibiotiki 6 no.2:111-115 F '61. (MIRA 14:5)

1. Kafedra mikrobiologii i antibiotikov (zav. - prof. M.N.Rotmistrov)
Kiyevskogo ordena Lenina universiteta imeni T.G.Shevchenko.
(FUNGICIDES) (SALICYLAMIDE)

ROTMISTROV, M.N. [Rotmistrov, M.M.]; KULIK, G.V. [Kulyk, H.V.]; VASILEVSKAYA, I.A. [Vasylevs'ka, I.O.]; RUDAYA, S.P. [Ruda, S.P.]; NEVKIPILAYA, O.S. [Nevkypila, O.S.]

Protistocide properties of phenol derivatives. Mikrobiol. zhur. 23 no.4:28-31 '61. (MIRA 15:4)

1. Kafedra mikrobiologii Kiyevskogo universiteta.
(PHENOLS) (TRICHOMONAS) (PARAMECIUM)

ROTMISTROV, M.N. [Rotmistrov, M.M.]; KULIK, G.V., [Kulyk, H.V.]; VASILEVSKAYA, I.A. [Vasylevs'ka, I.O.]

Salicylanilide and 4', 5-dibromosalicylanilide as new drugs with effective antimicrobic action. Farmatsev. zhur. 17 no.3:45-47 '62.
(MIRA 17:10)

1. Kafedra mikrobiologii i antibiotikov Kiyevskogo ordena Lenina gosudarstvennogo universiteta imeni Shevchenko.

ROTMISTROV, M.M.; MIKHNOVSKAYA, N.D. [Mikhnovs'ka, N.D.]; BAYSHEVA, V.G.
[Baisheva, V.H.]; KULIK, G.V. [Kulyk, H.B.]

Reduction of the sensitivity of microorganisms adapted in vitro to salicylanilides and alkylated phenols. Visnyk Kyiv. un. no.5. Ser.biol. no.1:69-73 '62. (MIRA 16:5)
(SALICYLANILIDE) (PHENOLS) (BACTERICIDES)

KULIK, G. V.

Anilides of 5-acenaphthoic acid and 3-acenaphthenesulfonic acid. Ukr. khim. zhur. 28 no.5:637-640 '62. (MIRA 15:10)

1. Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko.

(Naphthoic acid) (Anilides) (Naphthenes)

POTOTSKIY, I.I., prof.; ROTMISTROV, M.N., prof; KORNIYENKO, Z.A.; MIKHNOVSKAYA, N.D., kand.biolog.nauk; KULIK, G.V.

Treatment of epidermophytosis with 2'-chloroanilide of 5-chlorosalicylic acid. Vest.derm, i ven. no.9:42-45'62. (MIRA 16:7)

1. Iz kliniki kozhnych bolezney (zav. - prof. I.I. Pototskiy) Kiyevskogo meditsinskogo instituta i kafedry antibiotikov (zav. - prof. M.N.Rotmistrov) Kiyevskogo gosudarstvennogo universiteta. Rabota vypolnyalas' po zadaniyu Farmakologicheskogo komiteta pri Uchenom sovete Ministerstva zdravookhraneniya UkrSSR.

(SALICYLIC ACID—THERAPEUTIC USE) (DERMATOMYCOSIS)

KULIK, G.V.

Synthesis of N-dichloroiodo derivatives of salicyl[illegible]de and naphthalamide. Ukr.khim.zhur. 28 no.9:1100-1103 '62. (MIRA 15:12)

1. Kiyevskiy gosudarstvennyy universitet im. T.G. Shevchenko.
(Salicylamide) (Naphthalamide)

KULIK, G.V.

Synthesis of some amides and imides of naphthalic acid. Ukr.khim. zhur. 29 no.5:521-523 '63. (MIRA 16:9)

1. Kiyevskiy gosudarstvenny universitet im. T.G.Shevchenko.

POTOTSKIY, I.I.; ROTMISTROV, M.N.; KORNIYENKO, Z.A.; GAMALEYA, N.F.
KULIK, G.V.

Treatment of superficial yeast lesions of the skin with sodium caprilate ointment. Vrach. delo no.8:136-137 Ag'63. (MIRA 16:9)

1. Kafedra kozhnykh bolezney (zav. - prof. I.I.Pototskiy) Kiyevskogo meditsinskogo instituta i kafedra mikrobiologii (zav. - prof. M.N.Rotmistrov) Kiyevskogo universiteta.
(DERMATOMYCOSIS) (OINTMENTS)

KULIK, G.V. [Kulyk, H.V.]; VASILEVSKAYA, I.A. [Vasylevs'ka, I.O.]

Synthesis of the highly active antimicrobic drug salicylanilide and its halogen derivatives. Farmatsev. zhur. 18 no.1:10-13 '63.
(MIRA 17:10)

1. Laboratoriya antibiotikov Kiyevskogo ordena Lenina gosudarstvennogo universiteta im. Shevchenko.

ROTMISTROV, M.N. [Rotmistrov, M.M.]; KULIK, G.V. [Kulyk, H.V.]; NEVKIPILAYA, O.S. [Nevkypila, O.S.]

New synthetic antimicrobial preparations. Antimicrobial activity of some salicylanilide derivatives. Mikrobiol. zhur. 27 no.2:52-56 '65. (MIRA 18:5)

1. Kiyevskiy gosudarstvennyy universitet.

ROTMISTROV, N.N. [Rotmistrov, M.M.]; KULIK, G.V. [Kulyk, H.V.];
PASHKOVSKAYA, D.F. [Pashkovs'ka, D.F.]

Anilide of 3,5-dichlorosalicylic acid and 2,2'-aminophenyl disulfide, new antimicrobic compounds. Mikrobiol. zhur. 27 no.4:51-57 '65. (MIRA 18:8)

1. Kiyevskiy gosudarstvennyy universitet.

KULIK, G.V. [Kulyk, H.V.]; VASILEVSKAYA, I.A. [Vasylevs'ka, I.O.]

Antimicrobial properties of salicylanilide and its derivatives. (MIRA 18:10)
Mikrobiol.zhur. 26 no.4:80-85 '64.

KULIK, I.

KRASNOBAYEV, L. (g.Odessa); KOROBCHENKO, E.(Riga); KULIK, I.; TALLO, K.
(042518) (g.Tallinn); KHAYYERDAL, Tor [Heyerdahl, Thor]; GAUKHMAN,
R.(UA3CH) (Moskva); TURCHIN, V.(G. Novorossiysk).

Use radio communication on boat trips. Radio no.2:24-25 F '57.
(MIRA 10:3)

1. Starshiy inzhener radiokluba Dobrovol'nogo obshchestva sodeystviya armii, aviatsii i floty (for Krasnobayev).2. Starshiy inzhener radiokluba Dobrovol'nogo obshchestva sodeystviya armii, aviatsii i flotu Latviyskoy SSR (for Korebchenko).

(Radio in navigation)

KULIK, I., inzh. (Zhdanov)

Moisture indicator. Radio no.2:43 F '65. (MIRA 18:4)

KULIK, I., sud'ya vsesoyuznoy kategorii

Great sailing of the "little fleet." Voen.-znan. 41 no.12:42-43 D '65. (MIRA 18:12)

KULIK, Istvan

Baracs-Szolnok-Algyo-Baracs; the first 300 km triangle by Bocian. Repules 15 no.7:7 Jl '62.

DRAPALYUK, Ye.I.; KULIK, I.A., vetvrach; SOLOV'YEVA, Ye.M., vetvrach;
FESENKOVA, N.S., vetvrach.

Comparative diagnostic value of tuberculoprotein produced by the Ukrainian Institute of Experimental Veterinary Medicine and industrial tuberculin for cattle. Veterinariia 35 no.1:55-59 Ja '58.
(MIRA 11:2)

1. Direktor Dnepropetrovskoy oblvetbaklaboratorii (for Drapalyuk).
2. Dnepropetrovskaya oblvetbaklaboratoriya (for Kulik, Solov'yeva, Fesenkova).

(Tuberculosis in animals--Diagnosis)

ACC NR: AP6020218 SOURCE CODE: UR/0056/66/050/006/1617/1630

AUTHOR: Kulik, I. O.

ORG: Physicotechnical Institute of Low Temperatures, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut nizkikh temperatur akademii nauk Ukrainskoy SSR)

TITLE: Movement of Abrikosov lines under the effect of the electric field and the mechanism of energy dissipation in homogeneous superconductors

SOURCE: Zh eksper i teor fiz, v. 50, no. 6, 1966, 1617-1630

TOPIC TAGS: electric field, magnetic field, irradiation effect, high frequency, superconductor, Abrikosov line

ABSTRACT: A theory has been developed for "resistive" effects in superconductors of the second type near the upper critical field H_{c2}. The analysis was based on an application of the time-dependent Ginzburg—Landau equations. A phenomenological

Card 1/2

ACC NR: AP6020218

deduction of similar equations has been presented. If the normal (nonsuperconducting) current is not taken into account, the equations permit the existence of quasi-equilibrium superconducting states in crossed electric and magnetic fields; these states correspond to the movement of Abrikosov lines in a direction perpendicular to E and H. The upper critical field of H_{c2} is a function of the electric-field strength. However, for superconducting metals or alloys, the effect of variation of H_{c2} with E is very small. It has been shown that the resistance effects in superconductors must be accompanied by the high-frequency energy emission due to the movement of the periodic line structure. Irradiation of a superconductor in the mixed state by an external high-frequency field must change the shape of the volt-ampere curve when $H < H_{c2}$. The author thanks A. A. Abrikosov, corresponding member AN SSSR, I. Ye. Dzyaloshinskiy, and L. P. Pitayevskiy for their criticism and valuable remarks, which have been taken into consideration in preparing this article, and M. P. Kemoklidze for his interest in this work. Orig. art. has: 57 formulas. [Based on author's abstract] [NT]

SUB CODE: 20/ SUBM DATE: 15Jan66/ ORIG REF: 012/ OTH REF: 012/
18/

Card 2/2

BEZUGLYY, P.A.; YEREMENKO, V.V.; KUKUSHKIN, L.S.; KULIK, I.O.; MANZHELIY, V.G.; PERESADA, V.I.; PESCHANSKIY, V.G.; POPOV, V.A.; SHISHKIN, L.A.

Conference on the physics of the condensed state. Usp. fiz. nauk 88 no.2:387-393 F '66. (MIRA 19:2)

1. Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR.

KULIK, I.I.

Pneumodiagnosis of the cancer of the upper section of the stomach.
Vrach. delo no.11:33-37 N '61. (MIRA 14:11)

1. Kafedra rentgenologii i radiologii (zav. - prof. G.A.Burlachenko)
Khar'kovskogo meditsinskogo instituta.
(STOMACH—CANCER)

KAFAROV, V.V., koktor tekhnicheskikh nauk; DYTNERSKIY, Yu.I.; KULIK, I.I.

Improving the benzene recovery process. Koks i khim. no.3: 47-49 '56. (MLRA 9:8)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva (for Dytnerskiy); 2. Moskovskiy koksogazovyy zavod (for Kulik).

(Benzene)

SOV/68-58-9-11/21

AUTHORS: Dytnerskiy, Yu.I. (Candidate of Technical Science), S.U. Umarov and I.I. ~~Kulik~~

TITLE: A New Apparatus for Intensification of Heat and Mass Exchange Processes (Novyy apparat dlya intensifikatsii protsessov teplo- i massoobmena)

PERIODICAL: Koks i Khimiya, 1958, Nr 9, pp 43-44 (USSR)

ABSTRACT: The principle of operation of a foam tube column (Fig) is outlined. It consists of closely packed vertical tubes enclosed in a column. A gaseous phase is introduced into the bottom of the column and through a distributor passes upwards through the tubes. A liquid scrubbing phase is introduced at the top of the column through a side inlet and passes down through the tubes forming a foam with the vapour phase. As the foam moves downwards through the tubes the separation of the gas and liquid takes place. The liquid phase leaves the column through hydraulic seal, while the gas leaves through the outlet at the top of the column. The efficiency of the column (75 mm dia, 1200 mm high, containing 38 tubes 9 mm in dia and 670 mm high) was

Card 1/2

SOV/68-58-9-11/21

A New Apparatus for Intensification of Heat and Mass Exchange Processes

tested on the process of purification of coke oven gas from hydrogen sulphide by the arsenical-soda solution. Mean results are given in the table; the efficiency of the column was found to be 130 - 180 times higher than that of works' scrubbers.

There are 1 table, 1 figure and 6 references (4 Russian, 2 English)

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy Institut im. D.I. Mendeleyeva, and Moskovskiy koksogazovyy zavod (Moscow Institute of Chemical Technology imeni D.I. Mendeleyev, and Moscow Coke-Gas Works)

Card 2/2

SOV/68-59-2-14/20

AUTHORS: Kulik, I.I. and Dobrynin, L.N.

TITLE: Modernisation of the Existing Compressors Operating in the Coking Industry Will Sharply Decrease the Consumption of Electric Power (Modernizatsiya sushchestvuyushchego parka kompressorov koksokhimicheskoy promyshlennosti - put' k rezkomu snizheniyu raskhoda elektroenergii)

PERIODICAL: Koks i Khimiya, 1959, Nr 2, pp 53 - 55 (USSR)

ABSTRACT: Modernisation of compressors 2R-20/8 and 5KG-100/13 by incorporating valves of a new design proposed by I.I. Kulik is proposed. The new design is described and illustrated. There are 6 figures and 1 table.

ASSOCIATION: Moskovskiy koksogazovyy zavod (Moscow Coke-gas Works)

Card 1/1

KULIK, I.I.; GRIGOR'YEVA, Z.M.

Water processing at the Moscow Coke Gas Plant. Koks i khim. no.12:58-60 '61. (MIRA 15:2)

1. Moskovskiy koksogazovyy zavod.
(Moscow--Water--Softening)

KULIK, I. L.

Kulik, I. L. - "Changes in the birds of the synantropes in connection with the formation of the watershed", Trudy Darvinskogo gos. zapovednika na Rybin. vodokhranilishche, Issue 1, 1949, p. 303-12.

SO: U-411, 17 July 53, (Letopis 'Zhurnal 'nykh Statey, No. 20, 1949).

KULIK, I.L.

TUPIKOVA, N.V.; KULIK, I.L.

Diurnal activity of mice and its geographical variability. Zool.zhur. 33 no.2:433-442 Mr-Ap '54. (MLRA 7:5)

1. Otdel parazitologii i meditsinskoy zoologii (zaveduyushchiy - akademik Ye.N.Pavlovskiy) IEM Akademii meditsinskikh nauk SSSR im. N.F. Gamaleya. (Mice)

Kulik, I.L.

NAUMOV, N.P.; KULIK, I.L.

Mammal bones found in colonies of greater gerbils (Rhombonys opimus) Vop.kraev.,ob. i eksp.paraz. i med.zool. 9:203-217 '55. (MLRA 10:1)

1. Iz otdela parazitologii i meditsinskoy zoologii (zav. - akad. Ye.N.Pavlovskiy) Instituta epidemiologii i mikrobiologii imeni N.F.Gamaleya (dir. - deystvitel'nyychlen Akademii meditsinskikh nauk SSSR prof. G.V.Vygodchikov) Akademii meditsinskikh nauk SSSR.
(GERBILS) (RODENTIA)

KUCHERUK,V.V.; KULIK,I.L.

Analysis of the water rat population by craniological characteristics. Biul.MOIP. Otd.biol. 60 no.4:45-52 Jl-Ag'55. (MIRA 8:12)

(WATER VOLES)

KULIK, I. L.

KULIK, I. L.: "The population of large 'peschanka' (Rhombomys?) in the southwestern Aral region." Acad Med Sci USSR. Inst of Epidemiology and Microbiology imeni Honorary Academician N. F. Gamaleya. Moscow, 1956 DISSERTATION FOR THE DEGREE OF CANDIDATE IN BIOLOGICAL SCIENCE.

KNIZHNAYA LETOPIS', No. 24, 1956

KULIK, I.L.

Structure of the populations of greater gerbils in the northwestern part of the area inhabited by them. Biul. MOIP. Otd.biol. 62 no.5: 116 S-O '57. (MIRA 10:11)

(ARAL SEA REGION--GERBILS)

KULIK, I.L.

Population structure of greater gerbils in the northwestern part of the area inhabited by them [with summary in English]. Zool. zhur. 37 no.4:612-618 Ap '58. (MIRA 11:5)

1. Otdel infektsiy s prirodnoy ochagovost'yu Instituta epidemiologii i mikrobiologii im. N.F. Gamaleya Akademii meditsinskikh nauk SSSR, Moskva.

(Aral Sea region--Gerbils)

[illegible], I. L., [illegible], [illegible], [illegible], [illegible], [illegible], [illegible]

"Zoolog. factors of the existence of certain natural foci of diseases in which the vector plays a major epizootic role." p. [illegible]

[illegible] soveshchaniye po parazitologicheskim problemam i prirodnoochagovym boleznyam. 22-29 Oktyabrya 1959 g. (Tenth Conference on Parasitological Problems and Diseases with Natural Foci 22-29 October 1959), Moscow-Leningrad, 1959, Academy of Medical Sciences USSR and Academy of [illegible], No. 1 2[illegible]pp.

Inst. of Epidemiology and Microbiology, AMs USSR/ Moscow

KULIK, I.L.

Longevity of the greater gerbil under natural conditions. Zool.zhur. 38 no.6:944-947 Je '59. (MIRA 12:11)

1. Department of Parasitology and Medical Zoology, Institute of Epidemiology and Microbiology, Academy of Medical Sciences.

(Gerbils)

KULIK, I.L.; NIKITINA, N.A.

Fauna of small mammals in the forest zone of the Komi A.S.S.R.
Biul. MOIP. Otd. biol. 65 no. 6:3-16 N-D '60. (MIRA 14:2)
(KOMI A.S.S.R.—RODENTIA) (KOMI A.S.S.R.—INSECTIVORA)

NIKITINA, N.A.; KULIK, I.L.

Numeral and distributional changes in small mammals in the northern part of the Volga-Akhtuba Flood Plain in connection with the construction of the hydroelectric power station. Biul. MOIP. Otd. biol. 67 no.1:15-22 Ja-F '62. (MIRA 15:3)
(VOLGA-AKHTUBA FLOOD PLAIN--MAMMALS)

KULIK, I.L.

Materials on the ecology of the common hamster in the Altai. Biul.MOIP.Otd.biol. 67 no.4:16-25 Jl-Ag '62. (MIRA 15:10)
(ALTAI TERRITORY--HAMSTERS)

KULIK, I.L.; BEBESHKO, S.V.

Finds of the Siberian red-backed bank vole Clethrionomys rutilus Pall. in the Chuvash A.S.S.R. Zool. zhur. 42 no.1:148-149 '63.
(MIRA 16:5)

1. Institute of Epidemiology and Microbiology, Academy of Medical Sciences of the U.S.S.R., Moscow and Republican Sanitary-Epidemiological Station, Cheboxary.
(Chuvashia--Field mice)

PETRISHCHEVA, P.A., red.; OLSUF'YEV, N.G., red.; KULIK, I.L.,
red.

[Methods of studying natural focus diseases in man] Metody izucheniia prirodnykh ochagov boleznei cheloveka. Moskva, Meditsina, 1964. 306 p. (MIRA 17:5)

DUNAYEVA, T.N.; PETROV, V.G.; KULIK, I.L.; NIKITINA, N.A.; UGLOVOY, G.P.

Natural foci of tularemia on the territory of the Komi A.S.S.R. Biul. MOIP. Otd. biol. 69 no.1:28-40 Ja-F '64. (MIRA 17:4)

OLSUF'YEV, N.G.; KUCHERUK, V.V.; BORODIN, V.P.; PETROV, V.G.; UGLOVOY, G.P.; KULIK, I.L.; NIKITINA, N.A.; SAMSONOVA, A.P.; YERMOLOVA, A.D.; SPITSYN, N.A.

Changes in the conditions of existence of the natural tularemia focus in the northern part of the Volga-Akhtuba flood plain area in connection with the construction of the Volgograd Hydroelectric Power Station. Zhur. mikrobiol., epid. i immun. 40 no.11:127-132 N '63. (MIRA 17:12)

1. Iz Instituta epidemiologii i mikrobiologii imeni Gamalei AMN SSSR i Volgogradskoy oblastnoy sanitarno-epidemiologicheskoy stantsii.

[illegible]

naya sanitarno-epidemiologicheskaya stantsiya Chuvashskoy ASSR (Sanitation-Epidemiological Station of Chuvash ASSR)

UGLOVOY, G.P.; ANDRONNIKOV, V.A.; KULIK, I.L.; PETROV, V.G.; BEBESHKO, S.V.; DUNAYEVA, T.N.; STYAZHKOVA, F.S.

Experience in detecting natural foci of tularemia on the territory of the Chuvash A.S.S.R. Zhur.mikrobiol., epid. i immun. 42 no.4:21-25 Ap '65. (MIRA 18:5)

1. Institut epidemiologii i mikrobiologii imeni Gamalei AMN SSSR i Respublikanskaya sanitarno-epidemiologicheskaya stantsiya Chuvashskoy ASSR.

KUCHERUK, V.V.; KULIK, I.L.; NIKITINA, N.A.; PANTELEYEV, P.A.; RUBINA,
M.A.; TUPIKOVA, N.V.

Zoological factors in the existence of some natural foci of tularemia. Zhur. mikrobiol., epid. i immun. 42 no.6:80-86 '65.
(MIRA 18:9)

1. Institut epidemiologii i mikrobiologii imeni N.F. Gamalei AMN SSSR.

KULIK, I.L.; PLECHOVA, Z.N.; KHRAMEYEVA, A.V.; KOSTYREV, V.V.; BEBESHKO, S.V.;
KUZ'MINA, N.K.

Zoological premises for the existence of natural tularemia foci in the Chuvash A.S.S.R. Zool. zhur. 44 no.1:17-25 '65.

(MIRA 18:4)

1. Institut epidemiologii i mikrobiologii AMN SSSR, Moskva, Respublikanskaya sanigarno-epidemiologicheskaya stantsiya, Cheboksary, Moskovskiy gosudarstvennyy universitet i Cheboksarskiy pedagogicheskiy institut.

ACC NR: AT7005256 SOURCE CODE: UR/0000/66/000/000/0004/0017

AUTHOR: Kulik, I. O.

ORG: Physicotechnical Institute of Low Temperatures, AN UkrSSR (Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR)

TITLE: On a theory of superconductivity in a phonon model

SOURCE: AN UkrSSR. Elektronnyye svoystva metallov i splavov (Electronic properties of metals and alloys). Kiev, Izd-vo Naukova dumka, 1966, 4-17

TOPIC TAGS: superconductivity, phonon interaction, electron interaction, asymptotic property, thermodynamics

ABSTRACT: An attempt is made to develop a theory of superconductivity in a phonon model at ultimate temperatures. It is also attempted to prove that this theory leads to results agreeing with the corresponding results of the theory of superconductivity based on the Hamiltonian model of Bardin. Formulas are derived with the aid of the thermodynamic perturbation theory. The model potential

$$W(\xi, \xi'; \varepsilon, \varepsilon') = \begin{cases} 1, & |\varepsilon| \text{ and } |\varepsilon'| < \omega_m, \\ 0, & |\varepsilon| \text{ or } |\varepsilon'| > \omega_m. \end{cases}$$

Card 1/2

ACC NR: AT7005256

is shown to lead to the same results as the Bardin interaction potential

$$\left.\begin{array}{l} V = -\lambda W, \qquad \lambda > 0 \\ W(\xi, \xi'; \varepsilon, \varepsilon') = \begin{cases} 1, & |\xi| \text{ and } |\xi'| < \omega_m \\ 0, & |\xi| \text{ or } |\xi'| > \omega_m \end{cases} \end{array}\right\}.$$

where ω_m is the Debye frequency. All of the thermodynamic corollaries of the proposed model are the same as for the conventional Bardin theory. Orig. art. has: 45 formulas.

SUB CODE: 20/ SUBM DATE: 29May65/ ORIG REF: 010/ OTH REF: 003

L 44710-66 EWT(1) IJP(c) WW/GG

ACC NR: AP6031585 SOURCE CODE: UR/0386/66/004/004/0138/0140

71

70

AUTHOR: Kulik, I. O.

B

ORG: Physicotechnical Institute of Low Temperatures, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Nuclear magnetic resonance in the resistive state of superconductors of the second kind

SOURCE: Zhurnal Eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 4, 1966, 138-140

TOPIC TAGS: nuclear magnetic resonance, superconductivity, superconducting alloy, critical field, resistivity

ABSTRACT: This is a continuation of earlier work (Pis'ma ZhETF v. 3, 183, 1966; ZhETF v. 50, 1617, 1966) where it is shown that the motion of magnetic flux filaments in superconductors of the second kind in the "resistive" state leads to the occurrence of high-frequency radiation, which is monochromatic if the filaments form a regular lattice and move with constant velocity (such a situation can be realized in fully homogenized superconducting alloys). In the present paper the author proposes a method for observing this phenomenon with the aid of nuclear magnetic resonance (NMR). The calculation of the proposed effect shows that the following singularities are produced in the NMR spectrum when the vortices move: 1. Besides the main resonance ($\omega = \omega_0$), "satellites" appear, with frequencies $\omega_n = \omega_0 + n\Omega$. Their intensity is determined by the same expression as the main resonance at an exciting-field amplitude. Under

Card 1/2

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ACC NR: AP6031585

saturation conditions, the intensity of the NMR signal does not depend on the exciting field. 2. The NMR line may differ greatly in shape from Lorentzian. When the vortex structure moves, the absorption line becomes narrower and changes in shape. More detailed calculations will be published later. The purpose of the present note was to call attention to NMR as an effective tool for the study of the structure and distribution of the internal fields in superconductors of the second kind. The author thanks M. I. Kaganov for discussions. Orig. art. has: 2 formulas.

SUB CODE: 20/ SUBM DATE: 02Jun66/ ORIG REF: 003/ OTH REF: 001

Card 2/2

SOV/70-4-4-25/34

AUTHORS: Kulik, I.O. and Zil'berman, G.Ye.

TITLE: Investigation of Directed Crystallisation in Melts Containing Impurities. I.

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 4, pp 613-617 (USSR)

ABSTRACT: The study is theoretical but is directed towards the problems of growing crystals for scintillators by the Obreimov-Shubnikov or Stockbarger methods. It is also important for zone refining and other situations where there are impurities in a growing crystal. The diffusion equations are set up and lead to an integral equation which is soluble by iteration. The solution depends on two dimensionless parameters. These are g , the distribution coefficient, or coefficient of purification, and $\lambda = (vH/4D)^{1/2}$ where D is the diffusion coefficient, H the height of the crystalline phase and the melt above it and vt the depth which has solidified. Curves are drawn for $\lambda \gg 1$ and $\lambda \ll 1$. Both are experimentally observed under various conditions.

Card1/2

Investigation of Directed Crystallisation in Melts Containing Impurities SOV/70-4-4-25/34

Acknowledgments are made to L.G. Eydel'man, A.M. Ratner and Yu.V. Naboykin.
There are 3 figures and 7 references, of which 5 are Soviet and 2 English.

ASSOCIATION: Khar'kovskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh reaktivov (All-Union Scientific Research Institute for Chemical Reagents)

SUBMITTED: December 10, 1958

Card 2/2

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77114
SOV/70-4-6-15/31

AUTHORS: Kulik, I. O., Zil'berman, G. Ye.

TITLE: Study of Oriented Crystallization of Impure Melts. II

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 6, pp 898-903 (USSR)

ABSTRACT: Continuing the subject of their previous article (Abstract 74889), the authors analyze the effects of curved interfaces and of thermal diffusion on the impurity distribution in growing crystals. A curved crystal interface depending on ambient temperature gives rise to a radial impurity distribution which contributes essentially to the nonuniform composition of the grown crystal. Thermal diffusion is a function of the transverse temperature gradient in both the crystal and the melt. The rate at which a crystal interface moves transverse to itself is lower than the rate at which a constant ambient temperature becomes established. Consequently, assuming steady-state temperature, the coefficients of thermal conductivities χ_1 and χ_2 of the crystal and the melt can

Card 1/5

Study of Oriented Crystallization
of Impure Melts. II

77114
SOV/70-4-6-15/31

be determined according to Laplace equations

$$\frac{\partial T}{\partial z} = 0\Big|_{z=0};\ \frac{\partial T}{\partial z} = 0\Big|_{z=H};\ \frac{\partial T}{\partial r} + \sigma(T - T^{\circ}(z)) = 0\Big|_{r=a}; \qquad (1)$$

$$\varkappa_1 \frac{\partial T}{\partial z}\Big|_{z=h-0} - \varkappa_2 \frac{\partial T}{\partial z}\Big|_{z=h+0} = \rho q v. \qquad (2)$$

of which the second must be replaced by

$$\varkappa_1 \frac{\partial T_1}{\partial z} - \varkappa_2 \frac{\partial T_2}{\partial z} = \rho q v (1 + \zeta'(r)^2)^{-1/2}\Big|_{z=\zeta(r)}. \qquad (5)$$

where $z = \zeta(r)$ describes a curved interface in terms of the radius of curvature r and the height z of the crystalline layer in the container; $\frac{\partial T}{\partial n}$ is derivative from the temperature variable in direction normal to the interface; σ is the heat transfer coefficient of the container; ρ is density; q is latent heat of melting; ρqv is the heat flow produced by crystal growth; $T^{0}(z)$ is a given temperature such as in a furnace;

Study of Oriented Crystallization
of Impure Melts. II

77114
SOV/70-4-6-15/31

H is the height of the container. The change in impurity content because of curved interface is defined by

$$c_n = \sum_{n=0}^{\infty} u_n(z, t) \cdot I_0(\mu_n r / a), \qquad (10)$$

where μ_n is the root of $I_1(\mu_n)' = 0$; coefficient u_n at a given time t and height z is defined by

$$[D(\partial^2/\partial z^2 - \mu_n^2/a^2) - \partial/\partial t]\,u_n(z, t) = 0. \qquad (11)$$

D is the coefficient of diffusion. The Green equation in the case of a curved interface is written

$$G_n(z, t; \xi, \tau) = -\frac{1}{2\sqrt{\pi D(t-\tau)}}\,e^{-\frac{\mu_n^2 D}{a^2}(t-\tau)} \cdot e^{-\frac{(z-\xi)^2}{4D(t-\tau)}}\,v(t-\tau). \qquad (12)$$

Card 3/5

Study of Oriented Crystallization
of Impure Melts. II

77114
SOV/70-4-6-15/31

where τ and a are the same as in original Green functions. The change in impurity content because of thermal diffusion in a melt is defined in the case of a plane interface by

$$c_T^0 = -\eta e^{-\frac{v}{D}\xi}\int_0^{\xi} e^{\frac{v}{D}s} c^{(0)}(s)\frac{\partial}{\partial s}\ln T\,ds. \qquad (28)$$

and in the case of curved interface by

$$c_T(\xi, r) = c_T^{(0)}(\xi) - \eta\cdot\frac{aB}{2T_0}\left(\frac{r^2}{a^2}-\frac{1}{2}\right)c^{(0)}(\xi), \qquad (29)$$

where η denotes thermal diffusion, $B = \left(\frac{\partial T}{\partial r}\right)_{r = a}$; $c^{(o)}$ is impurity content before corrections for thermal diffusion and curved interface. The two corrections generally have opposite signs. The former correction is usually smaller and can frequently be disregarded. L. G. Eydel'man and A. M. Patner are acknowledged for discussions. There are 5 figures; and 4 Soviet references.

Card 4/5

Study of Oriented Crystallization
of Impure Melts. II

77114
SOV/70-4-6-15/31

ASSOCIATION: Khar'kov Branch of the All-Union Scientific Research Institute of Chemical Reagents (Khar'kovskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh reaktivov)

SUBMITTED: December 10, 1958

Card 5/5

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69689
S/126/60/009/03/012/033
E193/E483

AUTHORS: Geguzin, Ya.Ye. and Kulik, I.O.

TITLE: Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 3, pp 379-384 (USSR)

ABSTRACT: When single crystals or polycrystalline substances are maintained at elevated temperatures, physical changes occur which lead to a decrease in the free surface energy. The object of the investigation, described in the present paper was to derive expressions describing the kinetics of the process of "self-healing" (levelling) of artificial surface defects, in the belief that analytical solution of this problem would assist in the experimental studies of the abovementioned phenomena. The calculations were carried out for a defect whose geometry is illustrated in Fig 1, this shape having been chosen owing to its simplicity and also because it can be easily reproduced

Card 1/9

69689
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E193/E483

Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

experimentally. In the case of crystalline bodies, three mechanisms of the process of "self-healing" can be distinguished: volume diffusion, surface diffusion and transfer of the material by the vapour phase (re-condensation). Although these three mechanisms operate simultaneously, each of them was analyzed separately by the present authors in order to establish the conditions under which a given mechanism plays the predominant part. The relative contribution of the volume and surface diffusion can be assessed from the first principles of the theory of diffusion (Ref 3 and 6). For a given magnitude of the gradient, determining the diffusion flux, the ratio between the volume and surface diffusion fluxes ($J_v : J_s$) is, in the case under consideration, given (Ref 3,5) by $\varepsilon \simeq D_v L / D_s \Delta$, where: L - width of the scratch; Δ - thickness of the layer in which surface diffusion takes place; its

Card 2/9

69689

S/126/60/009/03/012/033
E193/E483

Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

magnitude is of the order of the lattice parameter, at temperatures near the melting point. If $L \simeq 10^{-4}$ cm, $\Delta \simeq 10^{-7}$ cm, $D_V/D_S \simeq 10^{-6}$ cm²/sec, then $\varepsilon \simeq 10^{-3}$, ie the volume diffusion flux is small in comparison with the surface diffusion. Although, in the case of large scratches ($L \simeq 10^{-1}$ to 10^{-5} cm), this conclusion may not be correct, the problem under consideration was analyzed under the assumption that only surface diffusion and re-condensation play a significant part in the process of levelling of a surface scratch. The factor which, in the case of both mechanisms, stimulates "self-healing" is the existence of a chemical potential gradient along the line joining the flat surface of the crystal with the centre (root) of the crack (Ref 3,5). The kinetics of the process of "self-healing" of such a crack are described by differential equations derived by Mullins (Ref 3) for the process of formation of a symmetrical groove between

Card 3/9

69689

S/126/60/009/03/012/033
E193/E483

Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

two adjacent grains in a polycrystalline specimen, Eq (1) relates to the re-condensation mechanism, Eq (2) to the mechanism of surface diffusion, the constants A and B being given by Eq (3) and (4) respectively, where: P - equilibrium vapour pressure; V - volume occupied by one atom in the crystal lattice; m - atomic mass; n - surface atom density; D_s - surface diffusion coefficient; k - Boltzman constant; T - absolute temperature; σ - surface tension coefficient assumed to be isotropic; δ - interatomic distance (lattice parameter). The solution of Eq (1) for the case of scratch illustrated in Fig 1, obtained for the starting and limiting conditions given by Eq (5), takes the form given by Eq (6). Since, under experimental conditions, it is easiest to determine the variation of the depth h of the scratch, an expression for h at a given moment was obtained from Eq (6); this expression

Card 4/9 4

69689

S/126/60/009/03/012/033
E193/E483

Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

is reproduced as Eq (7), where $\tau = 4At/\ell^2$ represents dimensionless time. The relationship between $h(t)/h_o$ and τ is represented by curve b in Fig 2. When T is large, the relationship described by Eq (7) becomes asymptotic and is given by Eq (7a). Since at $\tau = 1$, $h/h_o = 1/2$, the half-time of the "self-healing" process can be obtained from the formula given as Eq (8). It is pointed out in this connection that if the half-time $t^{2}_{1/2}$ is determined experimentally and if the vapour pressure of the investigated substance is known, it is possible to calculate the surface tension coefficient from the formula given as Eq (9). With the aid of Eq (6), it is possible to construct curves, representing the shape of the scratch at various τ. Curves of this type, constructed for the re-condensation mechanism, are

Card 5/9

69689
S/126/60/009/03/012/033
E193/E483

Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

reproduced in Fig 3. The solution of Eq (2) describing the kinetics of "self-healing" of the crack, illustrated in Fig 1, by the mechanism of surface diffusion was obtained for the starting and limiting conditions, given in Eq (10). The general solution is given by Eq (11) from which a formula (Eq (12)), describing the variation of the depth h of the scratch with time, was derived; in this formula $\zeta = 16 Bt/\ell^4$ represents dimensionless time. For $\zeta > 1$, $\varphi(\zeta)$ can be determined with the aid of an asymptotic function, given as Eq (12a), from which it will be seen that the depth of the scratch varies with time, according to $h \sim t^{-1/4}$. Curve a in Fig 2 represents the relationship $h/h_o = \varphi(\zeta)$. Since at $\zeta = 1$ $h/h_o = 1/2$, the half-time of the "self-healing" process (taking place by the mechanism of surface diffusion) can be calculated from Eq (13). From Eq (4) and (13) a formula for the surface diffusion coefficient can be

Card 6/9

Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

derived in the form given by Eq (14). Thus, experimental data on "self-healing" of surface defects by the mechanism of surface diffusion can be used for determining the coefficient of surface self-diffusion. Graphs, showing the varying of the profile of the scratch in time, are reproduced in Fig 4. Regarding the relative parts played by these two mechanisms in the investigated process, they can be assessed by considering the ratio γ of the half-times of the "self-healing" processes, which is given by Eq (15). It will be seen that γ depends, to a large extent, on the width of the scratch ℓ, which means that the re-condensation mechanism, insignificant in the initial stages of the "self-healing" process, may play the predominant part in its final stages. This is due to the fact that as the width of the scratch increases, so does the diffusion path, whereas the rate of transfer of the material by the

69689
S/126/60/009/03/012/033
E193/483

Investigation of Certain Physical Phenomena Occurring at High Temperature on the Surface of Crystalline Substances. IV. Analytical Study of the Kinetics of "Self-Healing" of Artificial Defects on the Surface of Solid Bodies

vapour phase is independent of the distance. Unfortunately, in the absence of data on D_s, no qualitative assessment of the magnitude of γ can be made. However, there is no doubt that as the temperature of the substance approaches its melting point, the part played by the re-condensation process becomes larger since both P_o and D_s increase exponentially with rising temperature and the heat of evaporation is always larger than the activation energy of surface self-diffusion. The present authors calculated the approximate value of γ for several metals characterized by low vapour pressure. To simplify the calculations, it was assumed that the surface diffusion coefficients are isotropic and that the crystal lattice in the vicinity of the scratch is in the state of equilibrium, ie free from micro-defects.

Card 8/9 Taking $D_s \simeq 10^{-4}$ to 10^{-5} cm^2/sec, $n \approx 10^{15}$ cm^{-2},